

Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Sulfur Recovery Complex
ExxonMobil Refining and Supply Company
East Baton Rouge, East Baton Rouge Parish, Louisiana
Agency Interest Number: 2638; PER19960005
Draft Permit 2300-V0

I. APPLICANT:

Company:

ExxonMobil Refining and Supply Company
P.O. Box 551
Baton Rouge, Louisiana 70821

Facility:

Sulfur Recovery Complex
4045 Scenic Highway, Baton Rouge, East Baton Rouge Parish, Louisiana
Approximate UTM coordinates are 675.685 kilometers East and 3373.097 kilometers North, Zone 15

II. FACILITY AND CURRENT PERMIT STATUS:

ExxonMobil Refining & Supply Company owns and operates a petroleum refinery in Baton Rouge, Louisiana. The Sulfur Recovery Complex (SRLA) is an existing complex at the Refinery, operating under state Permit 2300(M-1) dated June 25, 1997, and under a case-by-case insignificant activity for management of molten sulfur on site. This insignificant activity is included in this permit.

Several Part 70 permits addressing portions of the facility have already been issued. These include:

Permit #	Units or Sources	Date Issued
3120-00056-V1	Anchorage Tank Farm	02/18/2004
2385-V2	Catalytic Cracking Complex	10/10/2005
2589-V2	Light Ends	10/10/2005
2176-V2	Low Sulfur Gasolines	10/06/2005
2255-V2	Pipestill Complex	10/10/2005
2234-V2	Cokers	10/06/2005
2447-V1	Hydroprocessing	10/10/2005
2296-V1	Light Oils	05/20/2005

Sulfur Recovery Complex
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Permit #	Units or Sources	Date Issued
2261-V1	Reformer	10/10/2005
2795-V0	Refinery Tank Farm	02/18/2004
2047-V0	Docks	09/15/2004
2341-V1	Specialties Complex	04/19/2005
2363-V0	WCLA	11/17/2004
2926-V0	Complex Labs	08/31/2005

III. PROPOSED PERMIT / PROJECT INFORMATION:

Proposed Permit

A permit application and Emission Inventory Questionnaire were submitted by BRRF on October 2, 1996 requesting a Part 70 operating permit. Additional information dated October 20, 2005 was also received.

A notice requesting public comment on the permit was published in *The Advocate*, Baton Rouge, on <date>, 2006. The proposed permit was also sent to the US EPA Region VI.

Project description

Hydrogen sulfide (H₂S) laden acid gas from the monoethanolamine (MEA) regenerators and the ammonia acid gas from the sour water strippers are converted to elemental sulfur and an environmentally acceptable off gas at the SRLA. H₂S is converted to molten sulfur in three (3) Claus process units (SRLA-100/200/400), employing reaction furnaces and a series of catalytic reactors. The tail gas is then routed to the Tail Gas Clean-up Unit (TGCU) for removal of additional sulfur compounds.

At the TGCU, two (2) processing sections are used: the hydrogenation section and the amine section. The hydrogenation section (Beavon unit) takes the tail gas and converts the remaining sulfur compounds (primarily sulfur dioxide, carbon disulfide and carbonyl sulfide) to H₂S and carbon dioxide. The Beavon unit consists of two (2) reactors. Currently, one is primary and one is available to serve as backup; with the planned changes the reactors will operate in parallel. The tail gas then leaves the hydrogenation section and enters the amine section for H₂S removal via a circulating amine solution (FLEXORB™). The cleaned tail gas leaving the amine section can be emitted directly to the atmosphere (at SRLA/PV-T301), or to the incinerators (SRLA/F101 and SRLA/F201). In either disposition, off gas is analyzed using a CEMS to ensure compliance with NSPS standards.

The amine solution containing the absorbed H₂S from the tail gas stream is heated and sent to the amine regenerator tower. The amine solution is heated to remove the H₂S, thus regenerating the amine solution for re-use. The H₂S released from the regenerated amine solution is recycled to the Claus plants for conversion to elemental sulfur.

**Sulfur Recovery Complex
ExxonMobil Refining and Supply Company
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The recovered elemental sulfur is stored in the unit in sulfur pits. Vapors from the pits are sent to either the TGPU or the incinerators. Sulfur is removed from the pits and loaded onto trucks or rails cars for sale to third parties. The handling and transportation systems occasionally experience temporary disruptions. When this occurs, BRRF implement a contingency plan to manage sulfur outside the pits yet within the refinery boundaries.

For planned turnarounds of TGPU, the BRRF diverts tail gas from the Claus 100 and 200 units to the incinerators, bypassing the TGPU. When the TGPU is down, the NSPS-regulated SRLA-400 train is also shutdown.

Project Description: The BRRF will enrich the air supply to the Claus 400 Unit with oxygen. Oxygen enrichment involves blending an oxygen rich stream into a combustion air line. Additionally BRRF will operate the second Beavon hydrogenation reactor in parallel with the primary reactor and construct other minor debottlenecks to the Claus 400 unit and TGPU. As a result of these projects, BRRF will have the ability to handle higher sulfur crude oils and higher sulfur process gas oils. These projects will also allow additional sulfur removal to meet EPA's Clean Air Rules of 2004 requiring lower limits for the sulfur content in fuels used for on-road and non-road diesel engines. The Claus 100 or 200 units will not be modified.

Permitted Air Emissions

Estimated emissions in tons per year are as follows:

Pollutant	Before	After	Change
PM ₁₀	0.84	2.06	+1.22
SO ₂	140.70	146.37	+5.67
NO _x	26.98	29.02	+2.04
CO	342.10	225.46	-116.64
VOC*	0.50	27.88	+27.38
TRS	32.04	32.76	+0.72

* The increase in VOCs is due to incorporation of previously grandfathered and project emissions.

Prevention of Significant Deterioration Applicability

Prevention of Significant Deterioration (PSD) – Part 52

The difference between the past actual emissions and emissions from the Sulfur Recovery Oxygen Enrichment project exceeds the PSD thresholds for TRS. This project is subject to PSD review and constitutes a major modification for TRS.

Sulfur Recovery Complex
ExxonMobil Refining and Supply Company
Baton Rouge, East Baton Rouge Parish, Louisiana
Agency Interest Number: 2638; PER19960005
Draft Permit 2300-V0

Pollutant	Emission Rate	PSD de Minimis
PM ₁₀	+1.53	15
SO ₂	+34.57	40
NO _x	+22.2	40
CO	+72.98	100
H ₂ S	+3.89	10
TRS	+15.85	10
H ₂ SO ₄	+0.03	7

A review of the contemporaneous period revealed one Case-By-Case Insignificant TRS source, Sulfur Handling, which was included in the air quality impact analysis and added as a source.

Non-attainment New Source Review (NNSR) – Part 52

Under the NNSR provisions revised as a result of the recently promulgated 8-hour ozone National Ambient Air Quality Standard (NAAQS), BRRF is located in a marginal non-attainment area for ozone. The marginal classification has a 25 tons/yr threshold value for a major modification, and a 25 tons/yr trigger for consideration of the new emissions increases of NO_x and/or VOC. A 10 tons/yr trigger level has been set for highly reactive VOC (HRVOC).

Pollutant	Emission Rate	PSD de Minimis
NO _x	+22.20	25
VOC	+24.29	25
HRVOC	<0.01	10

The difference between the past actual emissions and emissions from the Sulfur Recovery Unit Oxygen Enrichment project does not exceed the NNSR threshold for NO_x, VOC, or HRVOC. Therefore, NNSR is not applicable to the modifications included with this project.

MACT requirements

The facility meets MACT requirement by complying with the Louisiana Refinery MACT Determination through the Louisiana Fugitive Emission Consolidation program for the project fugitives and NESHAP for Sulfur Recovery Units. The proposed project will comply with the appropriate MACT requirements.

Air Modeling Analysis

Louisiana Toxic Air Pollutant (LTAP) dispersion modeling is performed for the applicable LTAP compounds with emissions above the Minimum Emission Rate associated with this project. Impact on air quality from the emissions of the proposed unit will be below the National Ambient Air Quality Standards (NAAQS) and the Louisiana Ambient Air Standards (AAS) beyond industrial property.

**Sulfur Recovery Complex
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Agency Interest Number: 2638; PER19960005
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General Condition XVII Activities

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General Condition XVII Activities are not subject to testing, monitoring, reporting or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

IV. Regulatory Analysis

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit. Similarly, the Monitoring, Reporting and Recordkeeping necessary to demonstrate compliance with the applicable terms conditions and standards are provided in the Facility Specific Requirements Section of the draft permit.

New Source Performance Standards (NSPS) – Part 60

Subpart J: Standards of Performance for Petroleum Refineries

Claus 400 Unit will be modified as a result of the Oxygen Enrichment project. However, it is already subject to the requirements of NSPS Subpart J. Claus Units 100 and 200 are not being modified with this project and have not been modified after October 4, 1976. Therefore, NSPS Subpart J is not applicable to these units.

Subpart GGG: Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries

Affected facilities at the SRLA include equipment in NSPS fuel gas service for the incinerators. All refinery fugitive sources at affected facilities meet the requirements and emission standards of NSPS Subpart GGG, due to compliance with the Louisiana Refinery MACT.

National Emission Standards for Hazardous Air Pollutants (NESHAP) for Source Categories – Part 63

Subpart CC: Petroleum Refineries (Refinery MACT I)

The SRLA is not an affected source under NESHAP Subpart CC. Therefore, Subpart CC does not apply to the facility or the modifications.

**Sulfur Recovery Complex
ExxonMobil Refining and Supply Company
Baton Rouge, East Baton Rouge Parish, Louisiana
Agency Interest Number: 2638; PER19960005
Draft Permit 2300-V0**

Subpart UUU: Petroleum Refineries (Refinery MACT II)

Subpart UUU applies to catalytic cracking units, catalytic reforming units, and sulfur recovery units. The BRRF currently complies with 40 CFR 63 Subpart UUU for the SRLA and will continue to comply after the proposed modifications.

Compliance Assurance Monitoring (CAM) – Part 64

Sources at the SRLA are exempt from the requirements of CAM, because the complex is covered by a post-1990 NESHAP.

Chemical Accident Prevention – Part 68

The BRRF site, including the SRLA, complies with the requirements in 40 CFR 68. As required, risk management plans for the site were originally submitted by June 21, 1999 and updated and submitted by June 21, 2004.

State Operating Permit Programs (Title V) – Part 70

The SRLA operates under State Permit No. 2300(M-1) dated June 25, 1997. The initial Part 70 permit will be approved with the construction permit request.

State Regulations

Comprehensive Toxic Air Pollutant Emission Control Program – Chapter 51

Chapter 51 requires a major source emitting any Class I or Class II toxic air pollutant (TAP) in quantities greater than the Minimum Emission Rate (MER) for that pollutant to control emissions to a degree that constitutes MACT. Air Toxics Compliance Plans outlining MACT determinations for BRRF were submitted to the Louisiana Department of Environmental Quality (LDEQ) and approved as required by Chapter 51. The Refinery complies with the Louisiana Refinery MACT Determination for fugitives. The SRLA complies with the National Emission Standards for Hazardous Air Pollutants for Source Categories, Subpart UUU.

LAC 33:III.917 – Variances

When applicable, BRRF will request a variance from LAC 33:III.Chapter 15 when bypassing the Tail Gas Cleanup Unit.

LAC 33:III.919 – Emission Inventory

BRRF will submit an emissions report to the administrative authority annually.

LAC 33:III.2113 – Housekeeping

The SRLA is subject to this regulation. A written plan for housekeeping and maintenance has been developed and submitted to LDEQ, with a copy retained on-site.

**Sulfur Recovery Complex
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V. Permit Shields

A permit shield was not requested.

VI. Periodic Monitoring

No periodic monitoring is required.

VII. Applicability and Exemptions of Selected Subject Items

See Permit.

VIII. Streamlined Requirements

Unit	Program Being Streamlined	Stream Applicability	Overall Most Stringent Program
SRLA/FUG	LA Refinery MACT	5% VOTAP	LA Refinery MACT in the manner* agreed to be ExxonMobil in its approved Air Toxic Compliance Plan Approved April 18, 1996, per Source Notice and Agreement dated October 14, 1996.
	LAC 33:III.2122	10% VOC	
	40 CFR 63 Subpart CC - modified HON option	5% VOHAP	
	40 CFR 60 Subpart GGG	10% VOC	

*In lieu of the requirement to monitor connectors (that have been opened or had the seal broken) during the next scheduled monitoring period, connector tightness testing is currently performed prior to equipment startup. Tightness testing may consist of nitrogen pressure test, hydro testing, or high pressure steam. Tightness is verified by instrumentation or observation.

IX. Glossary

Best Available Control Technologies (BACT) - An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under this part which would be emitted from any proposed major stationary source or major modification which the administrative authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

Carbon Monoxide (CO) - A colorless, odorless gas which is an oxide of carbon.

Grandfathered Status- Those facilities that were under actual construction or operation as of June 19, 1969, the signature date of the original Clean Air Act. These facilities are not required to obtain a permit. Facilities that are subject to Part 70 (Title V) requirements lose grandfathered status and must apply for a permit.

Hydrogen Disulfide (H₂S) - A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the action of acids on metallic sulfides, and is an important chemical reagent.

Maximum Achievable Control Technology (MACT) - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

New Source Review (NSR) - A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_x) - Compounds whose molecules consists of nitrogen and oxygen.

Nonattainment New Source Review (NNSR) - A New Source Review permitting program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

Organic Compound - Any compound of carbon and another element. Examples: Methane (CH₄), Ethane (C₂H₆), Carbon Disulfide (CS₂)

Part 70 Operating Permit- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM₁₀- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) - The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) - A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

Sulfur Dioxide (SO₂) - An oxide of sulfur.

Title V permit - See Part 70 Operating Permit.

Volatile Organic Compound (VOC) - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.